

State of the Art: Medical Student Assessment

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Overview



- How has assessment changed?
- What makes a good assessment system in medical school?
- Is a good medical school assessment enough?
- Do national examinations improve the quality of care?

How has assessment changed?



- Focus of medical education has shifted to competencies
 - What must students be able to do at graduation
 - Seeks to address the mismatch between medical school graduates and health system needs
 - New roles and demands, technology, evidence-based medicine, professional fragmentation, internationalization...



Competencies

Five Star Doctor (Roles)	CanMeds (Roles)
Care provider	Medical expert
Decision maker	Collaborator
Communicator	Communicator
Community leader	Health advocate
Manager	Manager
	Professional
	Scholar

Competencies



Competencies and Assessment

- Competency movement depends on good assessment
 - Methods are chosen based on their ability to measure the competencies
 - Methods are considered part of a system
 - Comprehensive
 - Coherent
 - Continuous

Competencies and Methods

	MCQs	OSCE	Observed Encounters	Multi-source Feedback
Patient care	++	++++	++++	++
Medical Knowledge	++++	++	++	+
Communication Skills	+	+++	++	++++
Professionalism	+	++	++	++++

What makes a good assessment system?



- Five criteria for excellence in assessment (Aspire program of AMEE)
 - Serves and supports the mission of the institution
 - Supports, enhances, and creates learning
 - Ensures the competence of students
 - Subject to rigorous and continuous quality control
 - Commitment to scholarship and innovation

Serves and supports the mission

- It should fit into the overall vision and mission
- It should be tailored to the needs of the community
- It should be fit for purpose



EXCELLENT



GOOD



AVERAGE

Supports, enhances, and creates learning opportunities

- Strong alignment between assessment and the curriculum
- There is continuous formative assessment
- Assessment guides future learning
- Student performance influences the curriculum and faculty development
- There is remediation and support for students



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Ensures the competence of students as they progress

- Transparent relationship between assessment and progression
- Documentation that assessments are robust
 - Blueprint, scoring and standard-setting, statistical analysis...
- Clear rules for learner appeals



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Subject to a rigorous and continuous quality control process

- Cohesive program of faculty development
- Justification that assessments represent good practice
- Robust and continuous internal quality control
- Process for external review
- Appropriate local expertise



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Committed to scholarship and innovation

- Evidence of innovation in assessment
- Scholarly activity



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Is a medical school assessment enough?

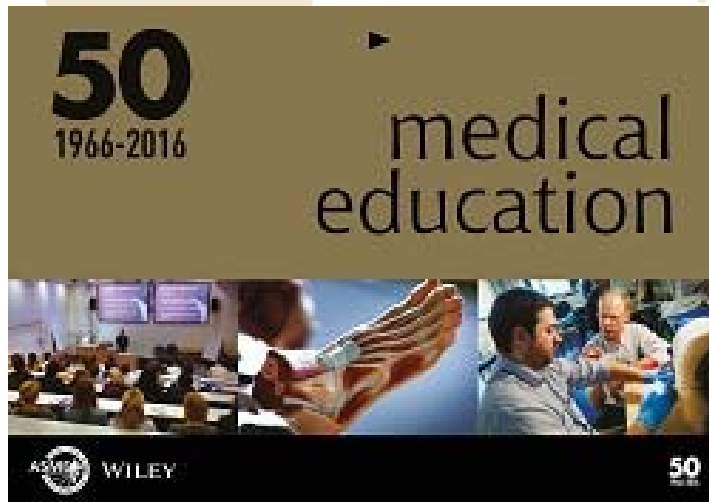


- Medical school assessments are not enough
 - Quality of students vary across schools
 - Standards vary across schools
 - Schools have a conflict of interest
 - Good assessment systems are not common
- Some form of licensure examination for graduates is needed

Do national examinations improve quality of care?



- Trends in national licensing exams
 - Increase in national licensing exams
 - Number and diversity of medical schools
 - Mobile workforce
 - Exams associated with
 - Educational markers
 - Practice performance
 - » Weak to moderate



*Swanson and Roberts
January 2016*

Research Challenges



- It is difficult to establish a relationship with practice performance
 - Examinees
 - Somewhat homogeneous to start
 - From the same country
 - Examinees cannot practice without passing the exam
 - Research must focus on the scores of passers
 - Restriction of range is an issue
 - It limits the ability to detect sizeable effects

Research Challenges



- It is difficult to establish a relationship with practice performance
 - Practice data
 - Difficult to acquire
 - Often generated long after licensure
 - Patients are not randomly assigned to doctors
 - Case mix, severity of illness...
 - Difficult to attribute patient outcomes to a doctor
 - Criteria contain errors, biases...
 - It limits the ability to detect sizeable effects

Research Challenges

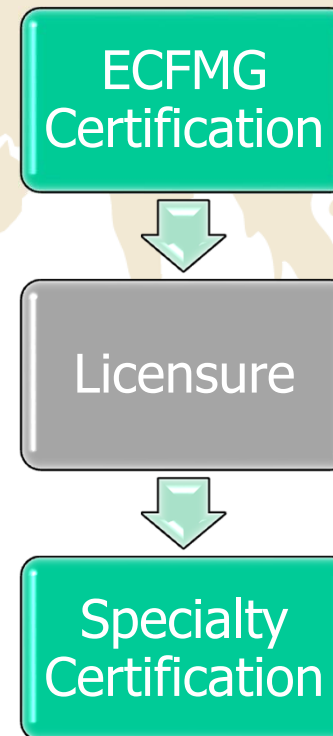


- In this context, there are advantages to
 - ECFMG certification
 - More heterogeneous group of examinees
 - Specialty certification in the U.S.
 - Voluntary so the unsuccessful still practice (10-20%)
 - Both are based on good national assessment systems that have been in place for decades
- Growing repositories of patient data

Research Challenges

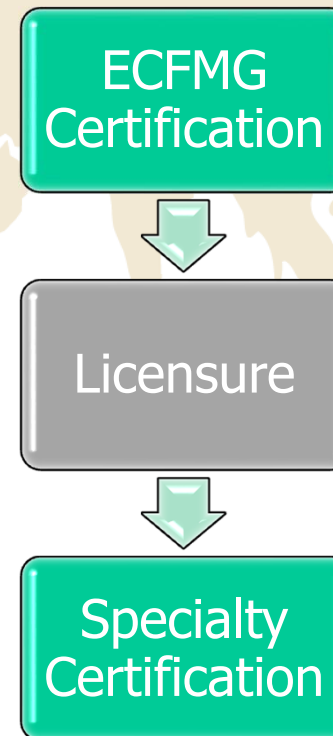


- Present work done with ECFMG and specialty certification using patient outcomes as the criteria
- Complementary to other research
 - Licensure
 - Outside the US
 - Other quality measures
 - Physician volume
 - Process of care (Tamblyn)



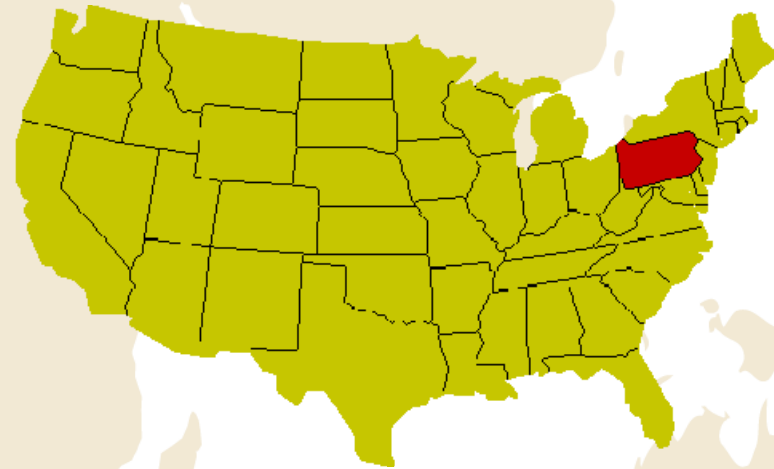
Sources of Physician Data

- Sources of data about physicians
 - AMA Masterfile
 - Basic information on all physicians in the US
 - Specialty certification
 - ECFMG
 - Physicians who are international medical graduates
 - American Board of Internal Medicine
 - Information on physicians who sought IM certification



Source of Patient and Hospital Data

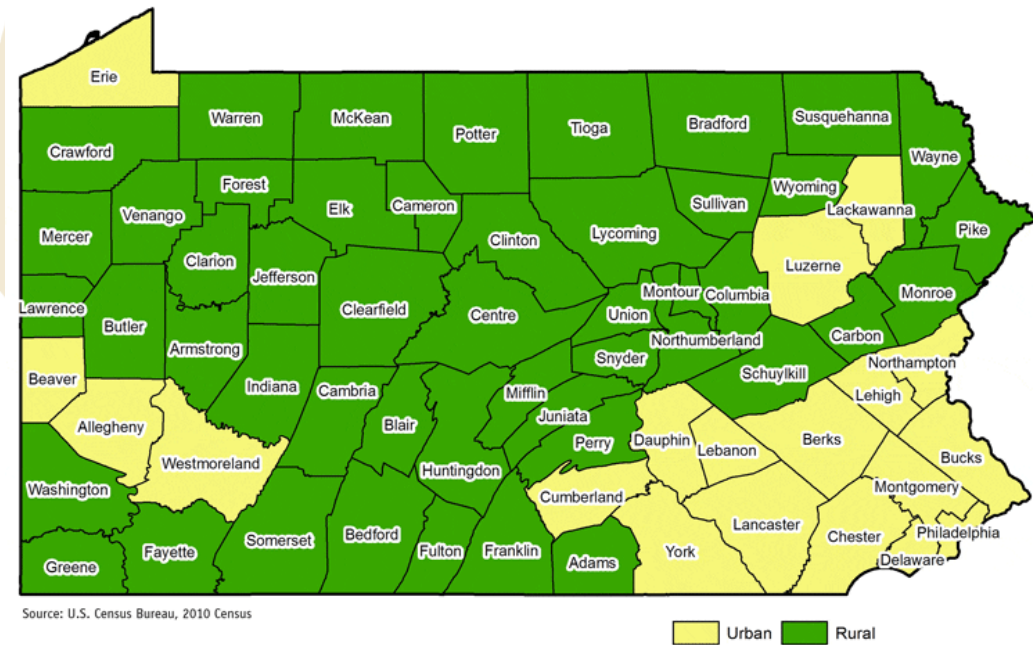
- Pennsylvania Healthcare Cost Containment Council
 - Collects all hospitalizations
 - Administrative and clinical data (probability of death on admission)
 - Creates report cards for doctors and hospitals
 - Shares the data with research entities



Source of Patient and Hospital Data

- PA is the 6th most populous state in the US
- 33rd largest in size
- 48 of the 67 counties are rural
 - 27% of the population
- Many IMGs

Rural Pennsylvania Counties





Analyses

- Analyses adjusted for
 - Patients clustered within doctors and doctors within hospitals
 - Patient, doctor, and hospital characteristics
 - Potential confounders-biases like hospital
 - Generalized estimating equations

“Statistics show that of those who contract the habit of eating, very few survive”

GB Shaw

Educational Commission for Foreign Medical Graduates



- Certification is required for graduates of non-US medical schools who want US postgraduate training
 - 20-25% of trainees and practicing doctors
- Motivation for ECFMG certification
 - Inability to make judgments about the quality of non-US medical schools
 - Desire for a merit-based entry system

Requirements for ECFMG Certification

Basic Medical Training

Completed in a WDMS school

Verified Credentials

Transcript and Diploma

Exams

USMLE Steps 1 & 2

Questions Addressed

- Are there differences between IMGs and USMGs?
 - If certification works, there should not be
- Are higher scores associated with better patient outcomes?
- Does recent experience and/or time since graduation matter?

“I wish I had an answer to that because I'm tired of answering that question.”

Y Berra

Does ECFMG certification work?

Doctors (N=6113)	Hospitals (N=184)	Patients (N=244,151)
Self-identified FM, IM, CV	All	Congestive heart failure Acute myocardial infarct
<ul style="list-style-type: none">• Specialty certification• Cardiologist• Years since graduation• Patient volume• USMG/USIMG/non-USIMG	<ul style="list-style-type: none">• Rural location• Patient volume	<ul style="list-style-type: none">• Probability of death on admission• In-hospital mortality

Does ECFMG certification work?

- Study focus
 - No difference between IMGs and USMGs
 - Non-USIMGs decreased RR by 9% against USMGs and 15% against USIMGs
- Experience-related
 - Recent individual volume reduced RR by 1% for every 10 hospitalizations
 - Time since graduation increased RR by 6% for every decade

Does the exam work?

Doctors (N=2525)	Hospitals (N=173)	Patients (N=60,958)
IMGs who were self-identified FM, IM, CV	All	Congestive heart failure Acute myocardial infarct
<ul style="list-style-type: none">• Step 2CK scores• Cardiologist• Specialty certification• Years since graduation (≥ 1992)• Patient volume• USIMG	<ul style="list-style-type: none">• Rural location• Patient volume	<ul style="list-style-type: none">• Probability of death on admission• In-hospital mortality



Does the exam work?

- Study focus
 - Each score SD was associated with a 4% decrease in RR for mortality
- Experience-related
 - Time since graduation was not statistically significant (restricted range)
 - Recent individual volume reduced RR by 1% for every 10 hospitalizations

Specialty Certification

- Specialty Boards (1916-)
 - Created by the specialty societies and AMA
 - Set standards for training and exam performance
 - Participation voluntary
 - Most physicians attempt certification and 80-90% become certified



**American Board
of Medical Specialties®**
Higher standards. Better care.™

Requirements for Specialty Certification

Training

US Medical School or ECFMG

Accredited postgraduate training

Good Standing

Valid and unrestricted medical license

Exams

Written exam (all Boards)

Oral exam (most Boards)



Questions Addressed

- Are there differences in patient outcomes between certified and uncertified physicians?
 - Does specialty certification work?
 - Do specialty exams work?
 - Does it work for surgeons too?
- Does recent experience and/or time since graduation matter?

Does specialty certification work?

Doctors (N=4546)	Hospitals	Patients (N=28,756)
Self-identified FM, IM, CV	All	Acute myocardial infarct
<ul style="list-style-type: none">• Specialty certification• Cardiologist• Years since first exam• Patient volume	<ul style="list-style-type: none">• Rural location• Advanced cardiac care	<ul style="list-style-type: none">• Probability of death on admission• In-hospital mortality

Does specialty certification work?

- Certification

- Certification had a statistically significant relationship with mortality

- Relative risk reduction of 15% and absolute reduction of 1.5-2%

- Experience

- Recent individual volume reduced RR by 6% for every 10 hospitalizations

- Time since graduation increased RR by 6% for every decade

Do specialty exams work?

Doctors (N=2277)	Hospitals	Patients (N=16,629)
Self-identified IM, CV	All	Acute myocardial infarct
<ul style="list-style-type: none">• Specialty certification• Cardiologist• Years since first exam• Patient volume	<ul style="list-style-type: none">• Rural location• Advanced cardiac care	<ul style="list-style-type: none">• Probability of death on admission• In-hospital mortality

Do specialty exams work?

- Exam-related

- Certification had a statistically significant relationship with mortality

- Relative risk reduction of 19% and absolute reduction of 1.5-2%

- Experience-related

- Time since first IM exam was not statistically significant
- Recent individual volume was not statistically significant

Does it work for surgeons too?

Operator (N=289)	Attending (N=2654)	Hospitals (N=70)	Patients (N=114,751)
Self-identified thoracic surgeons		All	CABG Valves
<ul style="list-style-type: none"> • Certified thoracic surgeon • Years since medical school • Patient volume • IMG • Operator-attending match 	<ul style="list-style-type: none"> • Certified thoracic surgeon • Certified cardiologist • Years since medical school • Patient volume • IMG 	<ul style="list-style-type: none"> • Rural location • Patient volume 	<ul style="list-style-type: none"> • Type of admission • Probability of death on admission • In-hospital mortality

Does it work for surgeons too?

- Study focus
 - Operating-attending match was associated with a 38% decrease in RR
- Experience-related
 - Operator
 - Time since graduation increased RR by 9% per decade
 - Recent individual volume reduced RR by 1% for every 20 procedures
 - Board-certified thoracic surgeon decreased RR by 18%
 - Attending physician
 - Time since graduation lowered RR by 7% per decade

Declining ability or failure to keep up?

- MOC examination
 - Items classified by a group of experts, with access to library resources
 - ‘Stable’ (26%)
 - ‘Changing’ (47%)
 - ‘New’ (27%)
 - Examinees (N=1947)
 - Classified into five groups by when they finished training



Declining ability or failure to keep up?

- Results
 - Scores on new and changing knowledge items decreased as time since training increased
 - Scores on stable knowledge showed no pattern and smaller changes



Summary



- How has assessment changed?
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